

In the claims:

1. (Currently amended) A method for *in situ*, stepwise, solid state synthesis of photosensitizers for titanium dioxide, comprising:
 - providing an anchor ligand having an anchoring end and a chelating end, wherein the anchor ligand is 4,4'-dicarboxy-2,2'-biquinoline ("bqda");
 - binding the anchoring end of the anchor ligand onto the titanium dioxide to give a bound anchor ligand with the chelating end;
 - incorporating a metal cation onto the chelating end of the bound anchor ligand to give a bound metal, wherein the metal cation is copper ("Cu"); and
 - binding one or more secondary ligands onto the bound metal, wherein the one or more secondary ligands are 2,2'-biquinoline ("biq"), 2,9-dimethyl-1,10-phenanthroline ("mph"), 2,9-dimethyl-2,2'-bipyridine ("mbp"), 4,7-diphenyl-1,10-phenanthroline ("bap"), or 1,10-phenanthroline ("phen").
2. (Currently amended) The method of claim 1, wherein the anchor ligand ~~comprises~~ is an azaaromatic ring structure, wherein the azaaromatic ring structure comprises one to four azaaromatic rings covalently joined to each other with between one and three covalent bonds, wherein the azaaromatic rings are substituted with one to four carboxy groups attached in place of any hydrogen on the perimeter of the azaaromatic ring system, and wherein there is only one carboxy group at any given azaaromatic ring position.
3. (Cancelled).
4. (Currently amended) The method of claim 1, wherein the metal cation ~~comprises~~ is a transition metal cation.
5. (Cancelled).

6. (Currently amended) The method of claim 1, wherein the metal cation further ~~comprises~~ possesses additional inorganic ligands, organic ligands, counterions, or a combination thereof.
7. (Currently amended) The method of claim 1, wherein the one or more secondary ligands independently are the same or different and have a structure ~~comprising~~ that is one or more substituted or unsubstituted heterocyclic rings containing one or more nitrogen atoms.
8. (Cancelled).
9. (Original) The photosensitizer for titanium dioxide prepared according to the method of claim 1.
10. (Currently amended) A ~~composition~~ photosensitizer having a general structure:

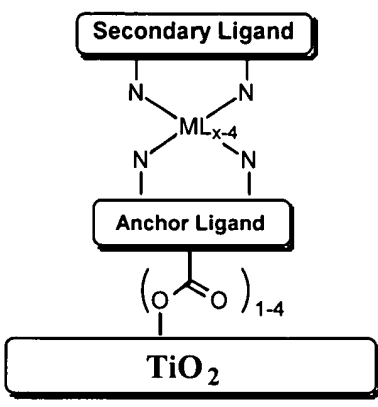
TiO₂—Anchor Ligand—M—Secondary Ligand,

wherein the Anchor Ligand is 4,4'-dicarboxy-2,2'-biquinoline (“bqda”),
wherein M is a metal cation, and wherein the metal cation is copper (“Cu”), and
wherein the Secondary Ligand is 2,2'-biquinoline (“biq”), 2,9-dimethyl-1,10-
phenanthroline (“mph”), 2,9-dimethyl-2,2'-bipyridine (“mbp”), 4,7-diphenyl-1,10-
phenanthroline (“bap”), or 1,10-phenanthroline (“phen”).

11. (Currently amended) The ~~composition~~ photosensitizer of claim 10, wherein M ~~comprises~~ is a transition metal cation.
12. (Cancelled).

13. (Currently amended) The ~~composition~~ photosensitizer of claim 10, wherein M ~~further comprises~~ possesses additional inorganic ligands, organic ligands, counterions, or a combination thereof.
14. (Currently amended) The ~~composition~~ photosensitizer of claim 10, wherein the anchor ligand ~~comprises~~ is an azaaromatic ring structure, wherein the azaaromatic ring structure comprises one to four azaaromatic rings covalently joined to each other with between one and three covalent bonds, wherein the azaaromatic rings are substituted with one to four carboxy groups attached in place of any hydrogen on the perimeter of the azaaromatic ring system, and wherein there is only one carboxy group at any given azaaromatic ring position.
15. (Cancelled).
16. (Currently amended) The ~~composition~~ photosensitizer of claim 10, wherein the secondary ligand ~~comprises~~ is one or more secondary ligands.
17. (Currently amended) The ~~composition~~ photosensitizer of claim 16, wherein the one or more secondary ligands independently are the same or different and have a structure ~~comprising that is~~ one or more substituted or unsubstituted heterocyclic rings containing one or more nitrogen atoms.
18. (Currently amended) The ~~composition~~ photosensitizer of claim 16, wherein the one or more secondary ligands independently are the same or different ~~and comprise a compound given in Figure 3 or a combination thereof.~~

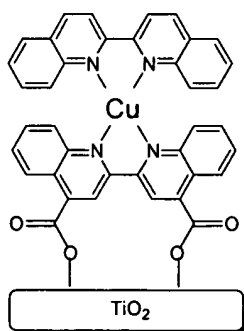
19. (Currently amended) The ~~composition~~ photosensitizer of claim 10, wherein the general structure is:



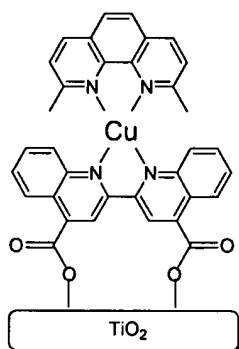
wherein L comprises an inorganic ligand, organic ligand, counterion, or a combination thereof; and

wherein x comprises an integer in a range of from four to six.

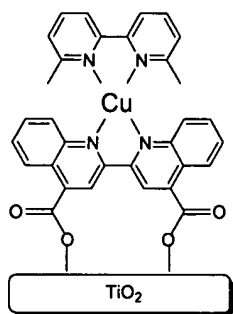
20. (Currently amended) The ~~composition~~ photosensitizer of claim 19, wherein the structure is:



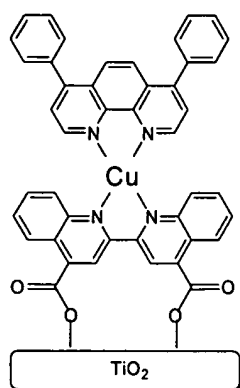
21. (Currently amended) The ~~composition~~ photosensitizer of claim 19, wherein the structure is:



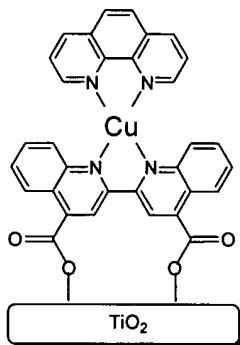
22. (Currently amended) The ~~composition~~ photosensitizer of claim 19, wherein the structure is:



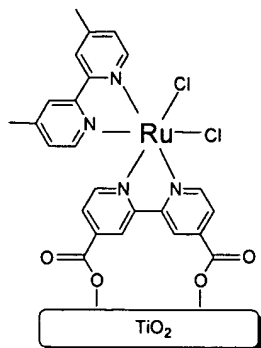
23. (Currently amended) The ~~composition~~ photosensitizer of claim 19, wherein the structure is:



24. (Currently amended) The ~~composition~~ photosensitizer of claim 19, wherein the structure is:



25. (Withdrawn) The composition of claim 19, wherein the structure is:



26. (Withdrawn) The composition of claim 19, wherein the structure is:

